Sore throat

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QUESTIONS

INTERVENTIONS

Key Messages

Treatment

- **Non-steroidal anti-inflammatory drugs** RCTs identified by a systematic review found that non-steroidal anti-inflammatory drugs reduced sore throat symptoms both over ≤ 24 hours and at 2–5 days compared with placebo. The range of benefit was 25–75% over ≤ 24 hours, and 33–93% at 2–5 days. Non-steroidal anti-inflammatory drugs are associated with gastrointestinal and renal adverse effects.
- **Paracetamol** Two RCTs identified by a systematic review found that a single dose of paracetamol reduced acute sore throat pain at 2–3 hours compared with placebo. Another RCT identified by the review found that paracetamol three times daily reduced sore throat pain at 2 days compared with placebo. We found no RCTs of other analgesics in people with sore throat.
- **Antibiotics** One systematic review found that antibiotics reduced the proportion of people with sore throat, fever, and headache at 3 days compared with placebo. The review found limited evidence from indirect comparisons that the absolute and relative reduction in sore throat symptoms at 3 days was greater in people with positive throat swabs for *Streptococcus* than in people with negative swabs. It gave no information on adverse effects. We found no RCTs that assessed the effects of antibiotics in reducing the severity of sore throat symptoms. Antibiotics may increase the risk of nausea, vomiting, rash, headache, and vaginitis. Widespread antibiotic use may lead to bacterial resistance to antibiotics.

- **Corticosteroids** One RCT in children and adolescents with moderate to severe sore throat infection found that oral dexamethasone reduced throat pain at 24 hours compared with placebo, and reduced the duration of pain. Another RCT in people with severe sore throat infection identified by a systematic review found that adding corticosteroids to antibiotics reduced the proportion of people with sore throat pain at 24 hours compared with adding placebo. It found more limited evidence that adding corticosteroids to antibiotics also reduced the duration of pain. The RCTs provided insufficient evidence to assess adverse effects of corticosteroids in people with sore throat. However, data from systematic reviews in people with other disorders suggest that corticosteroids may be associated with serious adverse effects, although this may be only after long term use.
- **Probiotics** RCTs suggested that super-colonisation with *Streptococcus* isolated from healthy individuals apparently resistant to infections from *Streptococcus* may reduce recurrent sore throat over 2–3 months compared with placebo. However, at present, super-colonisation with *Streptococcus* is available only experimentally. We found no RCTs of other probiotics.

Preventing complications

- **Antibiotics** One systematic review found that antibiotics reduced suppurative and non-suppurative complications of β haemolytic streptococcal pharyngitis compared with placebo. However, in industrialised countries, non-suppurative complications are extremely rare. Widespread antibiotic use may lead to bacterial resistance to antibiotics.

DEFINITION

Sore throat is an acute upper respiratory tract infection that affects the respiratory mucosa of the throat. Since infections can affect any part of the mucosa, it is often arbitrary whether an acute upper respiratory tract infection is called "sore throat" ("pharyngitis" or "tonsillitis"), "common cold", "sinusitis", "otitis media", or "bronchitis" (see figure 1, p 2084). Sometimes, all areas are affected (simultaneously or at different times) in one illness. In this chapter, we aim to cover people whose principal presenting symptom is sore throat. This may be associated with headache, fever, and general malaise. Suppurative complications include acute otitis media (most commonly), acute sinusitis, and peritonsillar abscess (quinsy). Non-suppurative complications include acute rheumatic fever and acute glomerulonephritis.

INCIDENCE/ PREVALENCE

There is little seasonal fluctuation in sore throat. About 10% of the Australian population present to primary healthcare services annually with an upper respiratory tract infection consisting predominantly of sore throat.[1] This reflects about one fifth of the overall annual incidence.[1] However, it is difficult to distinguish between the different types of upper respiratory tract infection.[2]

AETIOLOGY/ RISK FACTORS

The causative organisms of sore throat may be bacteria (*Streptococcus*, most commonly Group A β haemolytic, although sometimes others: *Haemophilus influenzae*, *Moraxella catarrhalis*, and others) or viruses (typically rhinovirus, but also coronavirus, respiratory syncytial virus, metapneumovirus, Ebstein–Barr, and others). It is difficult to distinguish bacterial from viral infections clinically. Some features are thought to predict the probability of the infection being caused by *Streptococcus* (fever > 38.5 °C; exudate on the tonsils; anterior neck lymphadenopathy; absence of cough).[3] Sore

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throat can be caused by processes other than primary infections, including gastro-oesophageal reflux, physical or chemical irritation (from nasogastric tubes or smoke, for example), and occasionally hay fever. However, we do not consider causes other than primary infection here.

PROGNOSIS Sore throat infections usually last a few days, with a few symptoms lasting longer, especially cough.[4] The untreated symptoms of sore throat disappear by 3 days in about 40% of people and untreated fevers in about 85%. By 1 week, 85% of people are symptom free. This natural history is similar in *Streptococcus* positive, negative, and untested patients.

AIMS OF INTERVENTION To relieve symptoms and to prevent suppurative and non-suppurative complications of sore throat.

OUTCOMES Reduction in severity and duration of symptoms (sore throat pain, general malaise, headache, fever); reduction in suppurative complications (acute otitis media, acute sinusitis, and quinsy) and non-suppurative complications (acute rheumatic fever, acute glomerulonephritis); time off work or school; patient satisfaction; healthcare utilisation.

METHODS *Clinical Evidence* search and appraisal May 2004. We excluded RCTs that only provided data about bacteriological studies of the throat, because bacteriological cure is not a clinically useful outcome for spontaneously remitting illness.

QUESTION **What are the effects of interventions to reduce symptoms of acute infective sore throat?** New

OPTION ANALGESICS

Two RCTs identified by a systematic review found that a single dose of paracetamol reduced acute sore throat pain at 2–3 hours compared with placebo. Another RCT identified by the review found that paracetamol three times daily reduced sore throat pain at 2 days compared with placebo. We found no RCTs of other analgesics in people with sore throat.

Benefits: We found one systematic review (search date 1999, 3 RCTs, 312 people with acute sore throat for ≤ 4 days, severity unclear) comparing paracetamol (acetaminophen) versus placebo.[5] All of the RCTs found that paracetamol significantly reduced sore throat pain compared with placebo. Two RCTs (81 adults, 77 children) found that a single dose of paracetamol significantly reduced sore throat pain at 2–3 hours compared with placebo (50% greater reduction than placebo in 1 RCT; $P < 0.01$; 31% greater reduction than placebo in the other; $P < 0.05$). The third RCT (154 children) found that paracetamol three times daily significantly reduced sore throat symptoms after 2 days (34% greater reduction than placebo; $P < 0.01$). It is unclear how pain was assessed in the RCTs. We found no RCTs of other analgesics.

Harms: The review gave no information on adverse effects.[5]

Comment: An update of the review[5] is under way.[6]

OPTION ANTIBIOTICS

One systematic review found that antibiotics reduced the proportion of people with sore throat, fever, and headache at 3 days compared with placebo. The review found limited evidence from indirect comparisons that the absolute and relative reduction in sore throat symptoms at 3 days was greater in people with positive throat swabs for *Streptococcus* than in people with negative swabs. It gave no information on adverse effects. We found no RCTs that assessed the effects of antibiotics in reducing the severity of sore throat symptoms. Antibiotics may increase the risk of nausea, vomiting, rash, headache, and vaginitis. Widespread antibiotic use may lead to bacterial resistance to antibiotics.

Benefits: We found one systematic review (search date 2003, 26 randomised or quasi-randomised trials, 12 669 people with sore throat, severity unclear).[4] It found that, compared with placebo, antibiotics slightly but significantly reduced the proportion of people with symptoms of sore throat at 3 days compared with placebo (14 trials; 930/1966 [47%] with antibiotics *v* 993/1499 [66%] with placebo; RR 0.41, 95% CI 0.36 to 0.48; NNT 3, 95% CI 2 to 3). This represents an average shortening of symptoms by about 1 day. The reduction in symptoms of sore throat remained significant at 6–8 days (12 trials; 226/1739 [13%] with antibiotics *v* 199/1079 [18%] with placebo; RR 0.61, 95% CI 0.52 to 0.73; NNT at 7 days 14, 95% CI 6 to 20), an average shortening of 16 hours. The review also found that antibiotics significantly reduced the proportion of people with fever at 3 days compared with placebo (7 trials; 87/712 [12%] with antibiotics *v* 114/622 [23%] with placebo; RR 0.69, 95% CI 0.53 to 0.88; NNT 21, 95% CI 14 to 54) and reduced headache at 3 days (3 trials; 152/545 [28%] with antibiotics *v* 117/366 [32%] with placebo; RR 0.79, 95% CI 0.65 to 0.96; NNT 15, 95% CI 9 to 78). The review found limited evidence from indirect comparisons that, in people with throat swabs positive for *Streptococcus*, the absolute and relative reduction in sore throat symptoms at 3 days was greater than in people with negative swabs (positive swabs: 10 trials; 432/1020 [42%] with antibiotics *v* 516/723 [71%] with placebo; RR 0.56, 95% CI 0.51 to 0.61; NNT 3, 95% CI 3 to 4; negative swabs: 5 trials; 222/411 [54%] with antibiotics *v* 192/265 [73%] with placebo; RR 0.76, 95% CI 0.68 to 0.86; NNT 6, 95% CI 4 to 10). We found no systematic review or RCTs that assessed severity of sore throat symptoms.

Harms: The systematic review gave no information on adverse effects. However, data from systematic reviews in people with other disorders suggested that antibiotics were associated with nausea, vomiting, headache, skin rash, and vaginitis (see acute bronchitis, p 2052, and acute otitis media in children, p 324).

Comment: Widespread antibiotic use may lead to bacterial resistance to antibiotics (see acute bronchitis, p 2052).

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OPTION NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

RCTs identified by a systematic review found that non-steroidal anti-inflammatory drugs reduced sore throat symptoms both over ≤ 24 hours and at 2–5 days compared with placebo. The range of benefit was 25–75% over ≤ 24 hours, and 33–93% at 2–5 days. Non-steroidal anti-inflammatory drugs are associated with gastrointestinal and renal adverse effects.

Benefits: We found one systematic review (search date 1999, 12 RCTs, 114 people with acute sore throat for ≤ 5 days, severity unclear) comparing non-steroidal anti-inflammatory drugs (NSAIDs) versus placebo.[5] The review did not perform a meta-analysis. Seven RCTs (493 people) identified by the review assessed the effects of NSAIDs (including 1 RCT of aspirin) over 24 hours or less. All of the RCTs found that NSAIDs significantly reduced throat pain compared with placebo. The range of significant improvements in throat pain compared with placebo ranged from 25–75% ($P < 0.05$ in all RCTs). Six RCTs (697 people) identified by the review assessed the effects of NSAIDs over more than 24 hours. All of the RCTs found that NSAIDs significantly reduced symptoms (primarily throat pain) over 2–5 days. The range of significant improvements in symptoms compared with placebo ranged from 33–93% ($P < 0.05$ in all RCTs). It is unclear how pain was assessed in the RCTs.[5]

Harms: The review gave no information on adverse effects.[5] However, data from systematic reviews in people with other disorders suggested that NSAIDs were associated with gastrointestinal and renal adverse effects (see NSAID chapter, p 1700).

Comment: An update of the review[5] is under way.[6]

OPTION CORTICOSTEROIDS

One RCT in children and adolescents with moderate to severe sore throat infection found that oral dexamethasone reduced throat pain at 24 hours compared with placebo, and reduced the duration of pain. Another RCT in people with severe sore throat infection identified by a systematic review found that adding corticosteroids to antibiotics reduced the proportion of people with sore throat pain at 24 hours compared with adding placebo. It found more limited evidence that adding corticosteroids to antibiotics also reduced the duration of pain. The RCTs provided insufficient evidence to assess adverse effects of corticosteroids in people with sore throat. However, data from systematic reviews in people with other disorders suggest that corticosteroids may be associated with serious adverse effects, although this may be only after long term use.

Benefits: We found one systematic review (search date 1999, 1 RCT) and one subsequent RCT.[5,7] **Versus placebo:** The review identified no RCTs of corticosteroids alone in people with sore throat.[5] The subsequent RCT (98 children and adolescents aged 5–18 years with moderate to severe sore throat infection defined as the presence of odynophagia/dysphagia associated with a McGrath Pain Face Scale of F or higher (happy [A]–sad [I]) compared oral corticosteroid (dexamethasone 10 mg) versus placebo over 24

hours.[7] It was reported only in an abstract. It found that dexamethasone significantly reduced the duration of throat pain compared with placebo (time to being pain free 9.8 hours with dexamethasone *v* 15.8 with placebo; $P < 0.02$) and significantly increased the proportion of people who were completely pain free at 48 hours (proportion with McGrath Pain Face Scale of A or B: 32/40 [80%] with dexamethasone *v* 27/46 [59%] with placebo; $P = 0.03$). **Plus antibiotics versus antibiotics alone:** The review[5] identified one RCT (51 adults with severe sore throat infection) comparing adding corticosteroid injection (dexamethasone 10 mg) to antibiotics versus adding placebo over 24 hours.[8] It found that adding dexamethasone significantly reduced sore throat pain at 24 hours (mean improvement in pain measured on a visual analogue scale from 0–30: 1.8 with adding dexamethasone *v* 1.2 with adding placebo; $P < 0.05$). It also found limited evidence that adding dexamethasone significantly reduced the duration of throat pain compared with placebo (completer analysis in 50% of people followed up for 7 days; mean time to being pain free reduced from 35 hours to 15 hours; $P < 0.02$).

Harms: The RCT found no adverse effects associated with oral dexamethasone, but may have been too small to detect clinically important adverse effects. **In combination with antibiotics:** The review gave no information on adverse effects.[5] However, data from systematic reviews in people with other disorders suggests that antibiotics may be associated with serious adverse effects, although this may be only after long term use. Potential harms of oral corticosteroids are covered elsewhere in *Clinical Evidence* (see rheumatoid arthritis, p 000 and asthma, p 2104).

Comment: More RCTs are needed. An update of the review[5] is under way.[6]

OPTION PROBIOTICS

RCTs suggested that super-colonisation with *Streptococcus* isolated from healthy individuals apparently resistant to infections from *Streptococcus* may reduce recurrent sore throat over 2–3 months compared with placebo. However, at present, super-colonisation with *Streptococcus* is available only experimentally. We found no RCTs of other probiotics.

Benefits: We found one systematic review[5] (search date 1999, 2 RCTs[9,10]) and one subsequent RCT[11] comparing super-colonisation with *Streptococcus* grown from a child resistant to infections from *Streptococcus* versus placebo (see comment below). We found no RCTs of other probiotics. The first RCT (36 people aged 5–40 years with culture confirmed recurrence of sore throat, all taking antibiotics) identified by the review found that super-colonisation with *Streptococcus* significantly reduced the proportion of people who had recurrence of streptococcal sore throat over 3 months compared with placebo (1/17 [6%] with supercolonisation *v* 11/19 [59%] with placebo; $P < 0.001$).[9] The second RCT (130 people aged 3–59 years with culture confirmed recurrence of sore throat, all taking antibiotics) identified by the review found no significant difference between super-colonisation with *Streptococcus* and placebo in the proportion of people who had recurrence of streptococcal sore throat over 8 weeks compared with placebo, although

fewer people using bacterial spray with *Streptococcus* had recurrence (22% with super-colonisation *v* 38% with placebo; P = 0.064).[10] The subsequent RCT (342 people, all treated with antibiotics) found that super-colonisation with *Streptococcus* significantly reduced recurrence over a mean of 3 months compared with placebo (proportion with recurrent sore throat: 36/189 [19%] with super-colonisation *v* 28/93 [30%] with placebo; P = 0.04).[11]

Harms: Both RCTs found no adverse effects associated with *Streptococcus* bacteriological spray.[9,11]

Comment: Super-colonisation with *Streptococcus* isolated from healthy individuals apparently resistant to infections from *Streptococcus* is available only experimentally. An update of the review[5] is under way.[6]

QUESTION What are the effects of interventions to prevent complications of acute infective sore throat? New

OPTION ANTIBIOTICS

One systematic review found that antibiotics reduced suppurative and non-suppurative complications of β haemolytic streptococcal pharyngitis compared with placebo. However, in industrialised countries, non-suppurative complications are extremely rare. Widespread antibiotic use may lead to bacterial resistance to antibiotics.

Benefits: We found one systematic review (search date 2003, 26 randomised or quasi-randomised trials, 12 669 people with sore throat, severity unclear) comparing antibiotics versus placebo to prevent complications of sore throat infection.[4] **Acute otitis media:** The review found that antibiotics significantly reduced acute otitis media at 14 days compared with placebo, although it was a rare complication in the trials identified (11 trials; 11/2325 [0.5%] with antibiotics *v* 28/1435 [2.0%] with placebo; RR 0.26, 95% CI 0.14 to 0.49; NNT 71, 95% CI 60 to 107).[4] **Acute rheumatic fever:** It found that antibiotics significantly reduced the proportion of people who had developed acute rheumatic fever at 2 months compared with placebo (16 trials; 37/5656 [0.7%] with antibiotics *v* 74/4445 [1.8%] with placebo; RR 0.29, 95% CI 0.18 to 0.44; NNT 77, 95% CI 67 to 98; see comment below).[4] The incidence of acute rheumatic fever has declined with time. The 111 cases of acute rheumatic fever assessed by the review all occurred in 10 trials undertaken between 1950 and 1961; there were no cases in the remaining five trials undertaken between 1987 and 2000. **Acute glomerulonephritis:** There were too few people who had acute glomerulonephritis to detect any possible protective effect of antibiotics in 11 trials (5147 people: 0/2927 [0%] with antibiotics *v* 2/2220 [0.1%] with placebo; RR 0.22, 95% CI 0.02 to 2.02; see comment below). **Acute sinusitis:** The review found no significant difference in the proportion of people who had developed acute sinusitis at 14 days between antibiotics and placebo, but there may have been too few events to detect a clinically important difference (8 trials; 4/1545 [0.3%] with antibiotics *v* 4/842 [0.5%] with placebo; RR 0.53, 95% CI 0.18 to 1.55). **Peritonsillar abscess**

(quinsy): The review found that antibiotics significantly reduced peritonsillar abscess at 2 months compared with placebo (6 trials; 2/1438 [0.1%] with antibiotics *v* 23/995 [2.3%] with placebo; RR 0.14, 95% CI 0.05 to 0.39; NNT 50, 95% CI 46 to 71).

Harms: The systematic review gave no information on adverse effects. However, data from systematic reviews in people with other disorders suggested that antibiotics were associated with nausea, vomiting, headache, skin rash, and vaginitis (see acute bronchitis topic, p 2052, and acute otitis media in children, p 324).

Comment: Acute rheumatic fever and acute glomerulonephritis associated with sore throat infection may be related to host antibodies to *Streptococcus* cross-reacting with host tissue in the heart and kidney. See also comment on antibiotics under treatments for sore throat, p 2079. Widespread antibiotic use may lead to bacterial resistance to antibiotics (see acute bronchitis, p 2052).

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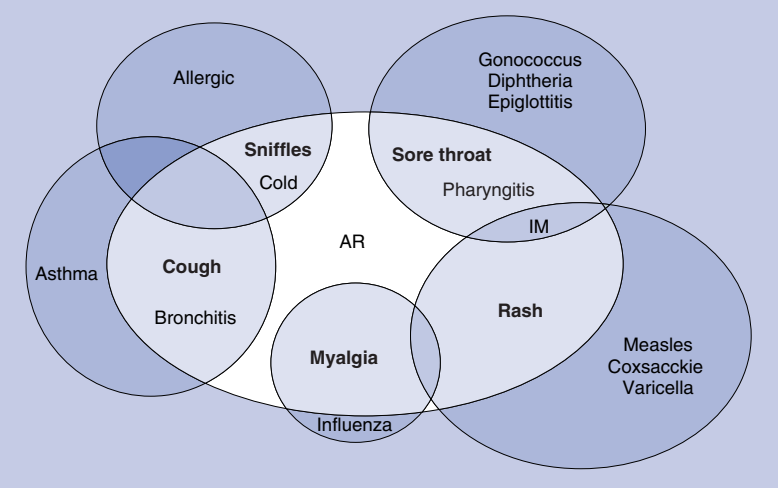

FIGURE 1 **Confusion and overlap in the classification of acute respiratory infections**